

**QUALIFICATION PROCEDURE FOR  
SHEAR CONNECTOR STUD WELDABILITY**  
LDH DESIGNATION: TR 601-65

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### Scope

1. The purpose of this procedure is to prescribe weldability tests which will qualify a shear connector stud for welding under shop or field conditions. The tests may be performed by a university, independent laboratory or other testing agency. The agency performing the tests shall submit to the manufacturer of the stud a certified report giving procedures and results for all tests including the information listed under report of tests.

### Duration of Qualification

2. A type and size of stud with arc shield, once qualified, is considered qualified until the manufacturer makes any change in the base of the stud, the flux, or the shield which effect the welding characteristics.

### Preparation of Specimens

3. (a) Test specimens shall be prepared by welding representative studs to the center of square specimen plates,  $\frac{1}{2}$  to  $\frac{3}{4}$  inch thick, of structural steel, ASTM A 36. At the option of the manufacturer studs may be welded to a large plate and the specimen plates cut to a size suitable for test equipment used.

(b) Studs shall be welded with power source, welding gun and control equipment as recommended by the manufacturer. Welding voltage, current and time shall be measured by suitable instrumentation and recorded for each specimen. Lift and plunge shall be at the optimum setting as recommended by the manufacturer.

(c) Thirty test specimens shall be welded consecutively with optimum current and time. Optimum current and time shall be the mid-point of the range normally recommended by the manufacturer for production welding.

(d) Thirty test specimens shall be welded consecutively with time held constant at optimum but with current 10% below optimum.

(e) Thirty test specimens shall be welded

consecutively with time held constant at optimum but with current 10% above optimum.

### Qualification Tests

4. (a) Tensile Tests - Ten of the specimens welded in accordance with 3(c), ten in accordance with 3(d), and ten in accordance with 3(e) shall be subjected to a tensile test in a fixture similar to that shown in Figure 1. A stud shall be considered as qualified if all test specimens have a tensile strength above the minimum specified in subsection 913.23 paragraph 2, Materials.

(b) Bend tests - Twenty of the specimens welded in accordance with 3(c), twenty in accordance with 3(d), and twenty in accordance with 3(e) shall be placed in the bend testing device shown in Figure 2 and bent alternately 30 degrees in opposite directions until failure occurs. A stud shall be considered as qualified if, on all test specimens, fracture occurs in the shank of the stud and not in the weld.

(c) If a weld failure occurs in any of the tensile or bend tests groups, that group may be retested. If weld failure repeats, the stud shall fail to qualify.

### Qualifications

5. For a manufacturer's studs and arc shields to be qualified, each group of thirty studs shall, by test or retest, meet the requirements prescribed in Section 4(a) and 4(b).

### Report of Tests

6. The laboratory report shall include the following:

(a) Drawings which show shapes and dimensions with tolerances of studs, arc shields, and flux.

(b) A complete description of materials used in the studs and arc shields, including the quantity and analysis of the flux.

(c) A certification that the studs and arc shields described in the report are qualified in accordance with paragraph 5.

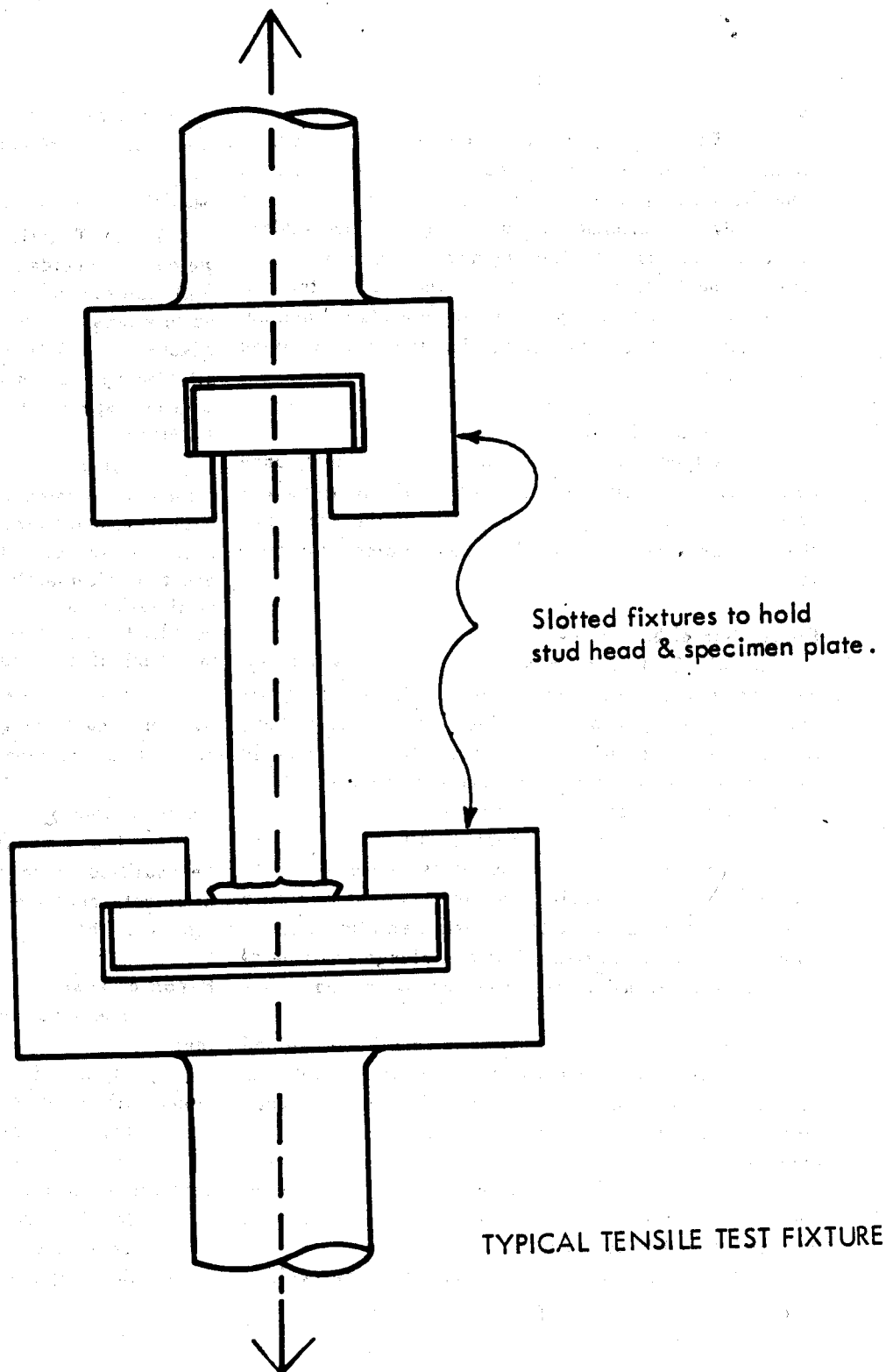


FIGURE #1

